

IN THE CLAIMS

Amend the following claims as indicated by the markings.

1. (Currently Amended) An optically pumped surface-emitting semiconductor laser device, comprising:
an external laser resonator;
a radiation-generating quantum well structure formed by a semi-conductor layer sequence,
said radiation-generating quantum well structure being provided for generating radiation in said external laser resonator, said semi-conductor layer sequence being epitaxially and successively grown on a common substrate, and
a pump radiation source with a radiation region for optically pumping the radiation generating quantum well structure, said pump radiation source including an edge-emitting semiconductor structure comprising a first waveguide layer and a second waveguide layer and an active layer between said first and second waveguide layers, said edge-emitting semiconductor structure being formed by the semi-conductor layer sequence being epitaxially and successively grown on the common substrate.

2.(Original) An optically pumped surface emitting semiconductor laser device according to claim 1, wherein the radiation generating quantum well structure and the pump radiation source are being arranged side by side such that:

the radiation generating quantum well structure and the radiation emitting region of the pump radiation source lie at a same height above the common substrate; and

a pump radiation from the pump radiation source is being laterally coupled into the radiation generating quantum well structure during operation of the optically pumped surface emitting semiconductor laser device.

3. (Currently Amended) An optically pumped surface emitting semiconductor laser device according to claim 2, wherein:

the radiation generating quantum well structure is being surrounded by the edge emitting semiconductor structure; and

the pump radiation source is a gain guided radiation emitting active region defined by being formed on a basis of a current injection path on a surface of the edge emitting semiconductor laser structure.

4. (Currently Amended) An optically pumped surface emitting semiconductor laser device according to claim 2, wherein:

the radiation generating quantum well structure is being surrounded by the edge emitting semiconductor structure; and

the pump radiation source is an index guided radiation emitting active region that is being defined by ~~on a basis of~~ a current injection path on a surface of the edge emitting semiconductor structure in combination with trenches in the edge emitting semiconductor structure formed along a current injection path.

5. (Original) An optically pumped surface emitting semiconductor laser device according to claim 4 , wherein ends of current injection paths facing toward the radiation generating quantum well structure include a spacing of 10 μm - 50 μm therefrom.

6. (Original) An optically pumped surface emitting semiconductor laser device according to claim 1, wherein the pump radiation source includes two pump radiation sources being arranged at opposite sides of the radiation generating quantum well structure, said two pump radiation sources for emitting pump radiation into the radiation generating quantum well structure during operation.

7. (Original) An optically pumped surface emitting semiconductor laser device according to claim 1, wherein the pump radiation source includes a plurality of pump radiation sources being arranged in a star like manner around the radiation generating quantum well structure, said plurality of pump radiation sources for emitting pump radiation into the radiation generating quantum well structure during operation.

8. (Original) An optically pumped surface emitting semiconductor laser device according to claim 6, wherein the two pump radiation sources together form a laser structure for an optical pumping with laser emission.

9. (Original) An optically pumped surface emitting semiconductor laser device according to claim 1, wherein the pump radiation source include a ring laser.

10. (Original) An optically pumped surface emitting semiconductor laser device according to claim 9, wherein the radiation generating quantum well structure is arranged within a resonator of the ring laser.

11. (Original) An optically pumped surface emitting semiconductor laser device according to 10, wherein the resonator of the ring laser is formed by an annularly closed waveguide.

12. (Original) An optically pumped surface emitting semiconductor laser device according to claim 9, wherein the edge emitting semiconductor structure is being surrounded by a medium with a refractive index being less than a refractive index of the edge emitting semiconductor structure.

13. (Original) An optically pumped surface emitting Semiconductor laser device according to claim 9, wherein the edge emitting semiconductor structure is surrounded by at least one of a gaseous medium and a dielectric.

14. (Original) An optically pumped surface emitting semiconductor laser device according to claim 9, wherein the edge emitting semiconductor structure is being formed as a cylindrical body with one of a circular and annular cross section.

15. (Original) An optically pumped surface emitting Semiconductor laser device according to claim 9, wherein the edge emitting semiconductor structure is being formed as a prismatic body with a cross section in a form of one of a polygon and a polygonal ring.

16.(Previously Presented) An optically pumped surface-emitting semiconductor laser device according to claim 1, wherein the edge-emitting semiconductor structure includes an active layer embedded between said first waveguide layer and said second waveguide layer, said first wave guide layer and said second waveguide layer being embedded between a first cladding layer and a second cladding layer.

17. (Original) An optically pumped surface emitting semiconductor laser device according to claim 16, wherein:

a boundary surface between the edge emitting semiconductor structure and the radiation generating quantum well structure is partially reflective.

18. (Original) An optically pumped surface emitting semiconductor laser device according to claim 1, wherein:

the edge emitting semiconductor structure includes a plurality of active layers that are being connected in series with tunnel transitions, and

the radiation generating quantum well structure includes a plurality of quantum well groups that respectively lie at a same height above the common substrate as an active layer of the edge emitting semiconductor structure.

19. (Original) An optically pumped surface emitting semiconductor laser device according to claim 1, wherein:

the radiation emitting quantum well structure and the pump radiation source are arranged above one another on the common substrate; and

the radiation emitting quantum well structure is being optically coupled to the edge emitting semiconductor structure, so that a pump radiation is being guided into the radiation emitting quantum well structure during operation of the optically pumped surface emitting semiconductor laser device.

20.(Previously Presented) An optically pumped surface-emitting semiconductor laser device according to claim 19, wherein:

the edge-emitting semiconductor structure includes said first waveguide layer and said second waveguide layer and an active layer, said active layer arranged between the first waveguide layer and the second waveguide layer; and the quantum well structure being epitaxially grown on the second waveguide layer, covers only a sub-region of the edge-emitting semiconductor structure and is being optically coupled thereto, so that a part of the pump radiation generated in the edge-emitting semiconductor structure is being guided into the quantum well structure.

21. (Original) An optically pumped surface emitting semiconductor laser device according to claim 20, wherein:

the pump radiation source is a gain guided radiation emitting active region being formed in the edge emitting semiconductor structure via a correspondingly structured current injection path on a surface of the second waveguide layer.

22. (Original) An optically pumped surface emitting Semiconductor laser device according to claim 21, wherein:

the pump radiation source is being formed in combination with correspondingly etched trenches in the second waveguide layer.

23. (Original) An optically pumped surface emitting Semiconductor laser device according to claim 20, wherein a refractive index of the second waveguide layer is higher than a refractive index of the first waveguide layer.

24. (Original) An optically pumped surface emitting semiconductor laser device according to claim 20, wherein the active layer is being asymmetrically placed in the waveguide formed by the first waveguide layer and the second waveguide layer.

25. (Original) An optically pumped surface emitting semiconductor laser device according to claim 2 , wherein:

the common substrate is being composed of a material being transmissive for a laser beam generated in the optically pumped surface emitting semiconductor laser device; and

a resonator mirror layer with an optimally substantially high reflection coefficient is being applied on a side of the radiation generating quantum well structure facing away from the common substrate.

Claims 26 – 29 (Cancelled)